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A new genus of Spirostreptidae from the northern Andes

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ABSTRACT

The new generic name *Hyloecostreptus* is defined to accommodate the type species *H. shelleyi* from northeastern Peru and *Nanostreptus incertilineatus* Silvestri and *N. inconstans* Carl, both from Colombia.

As improved knowledge of any group of organisms results in greater precision in the definition of supraspecific categories, discordant elements are often excluded from existing generic taxa and require the establishment of new genera for their accomodation. Recent examination of the Neotropical genus *Nanostreptus* shows that several species currently placed there are not congeneric with the type species of that name, and are here reclassified in the context of a new generic category. An insightful precedent for this action has already been established (Krabbe, 1982) in connection with two of the species: "Die weitere Zuordnung zu *Nanostreptus* ist nur vorläufig und kann meiner Meinung nach nicht beibehalten werden." The following account will justify the omission of these species from a review of *Nanostreptus* now in preparation.

Hyloecostreptus, new genus

TYPE SPECIES: *H. shelleyi,* new species, from northeastern Peru. The genus also includes *Nanostreptus incertilineatus* Silvestri, 1898, and *Spirostreptus (Nanostreptus) inconstans* Carl, 1914, both described from Colombia.

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NAME: A neologism composed of the Greek elements *hyloecos* ("living in the forest", the equivalent of the Italian *silvestre*) + the combining form *-streptus*, recognizing the numerous contributions of Filippo Silvestri to the knowledge of Neotropical diplopods.

DIAGNOSIS: Gonosternum subtriangular, the median apex acute, not coalesced basally with metaplica. Torsus located at or close to the primary curvature of the telopodite; antetorsal process small, visible in anterior aspect; telopodite long, falcate, unbranched, with rudimentary apical process. Proplica arcuately bowed laterad just distad to midlength. Auricula present, extending to about midlength of metaplica. Prefemoral process of 1st pair of male legs large, entire mesal edges in contact..

Gnathochilarium: Distal third of stipes prominently convex, much elevated above remainder of surface. Mentum subtrapezoidal, entire perimeter margined. Prebasilar entire, but decurved medially, forming with base of mentum an oval cavity. 6th antennomere with small transverse sensory pit, 5th with rudimentary circular pit. Anterior lateral corner of collum slightly produced ventrad, with a short submarginal ridge and longer inner groove..

Pro- and metazona of nearly equal diameter, surface smooth except for 16-18 striations above leg bases. Epiproct not produced over paraprocts, latter with compressed distal edge. Coxal sockets open posterially. Tibiae and tarsi of males with small ventral pads back to about midbody. Stigmata small, entirely within the sterna.

RANGE: The Andes Mountains and adjacent lowlands on the east, from Peru to Colombia (Fig. 12). That only three species are so far known from this extensive range implies that many additional species remain to be discovered.

RELATIONSHIPS: With present knowledge of Neotropical spirosteptids, I am unable to identify a plausible adelphotaxon for this genus, nor even a group of genera to which it might have some affinity. Location of the gonopod torsus at or very close to the primary curvature, and relatively small antetorsal process render the genus quite distinctive in the Andean fauna.

Hyloecostreptus shelleyi, new species

Figures 1-8

MATERIAL: Male holotype and three female topoparatypes (NCSM A3549) from a farm on the Yavari River, ca. 81 km upstream of Benjamin Constant, Dpto Loreto, Peru; Rowland M. Shelley leg. 19 July 1977.

NAME: For the collector, in recognition of his numerous contributions to the knowledge of Diplopoda.

DIAGNOSIS: Readily distinguished from the other two members of the genus by the elongate, sublinguliform apex of the metaplica (contrast Figs. 6, 9, and 10).

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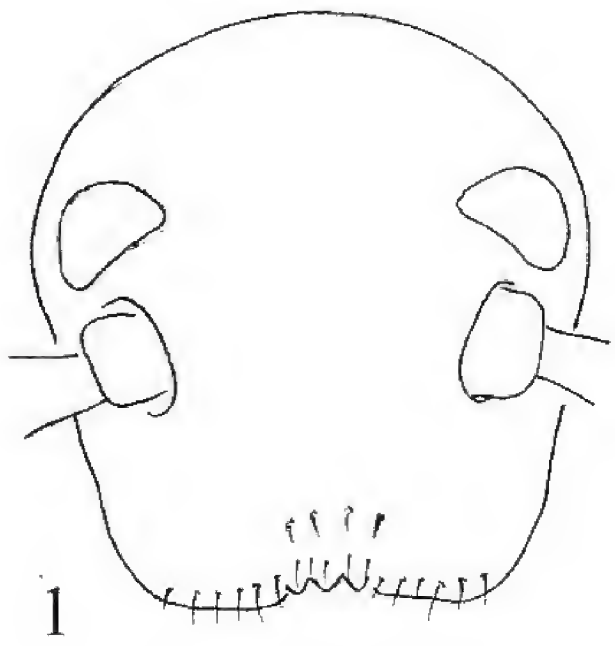

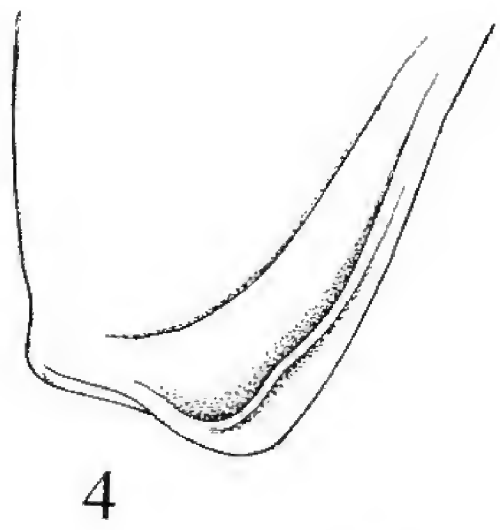

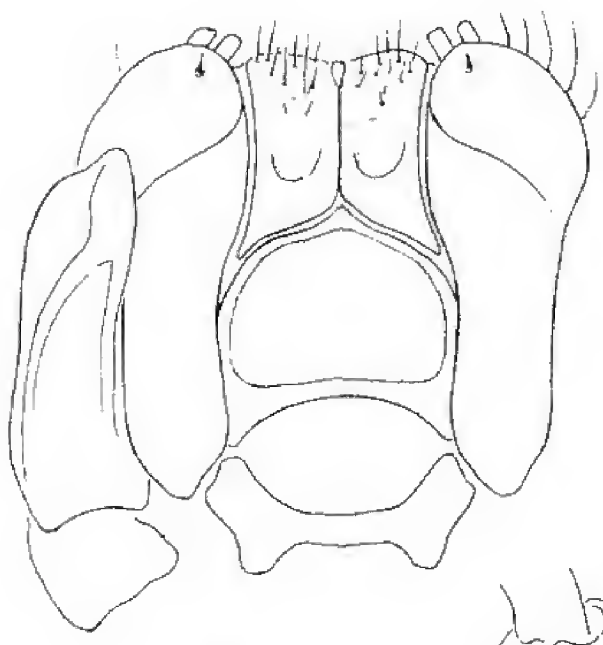

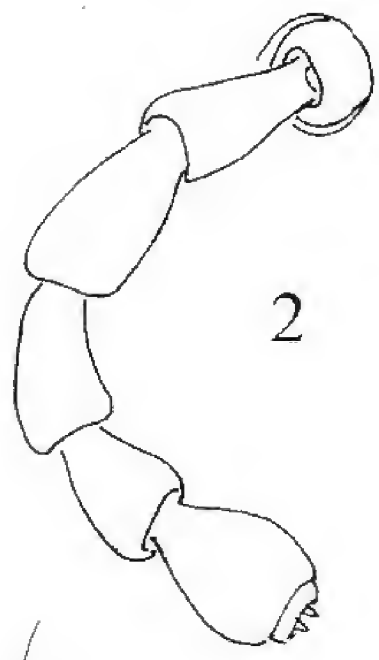

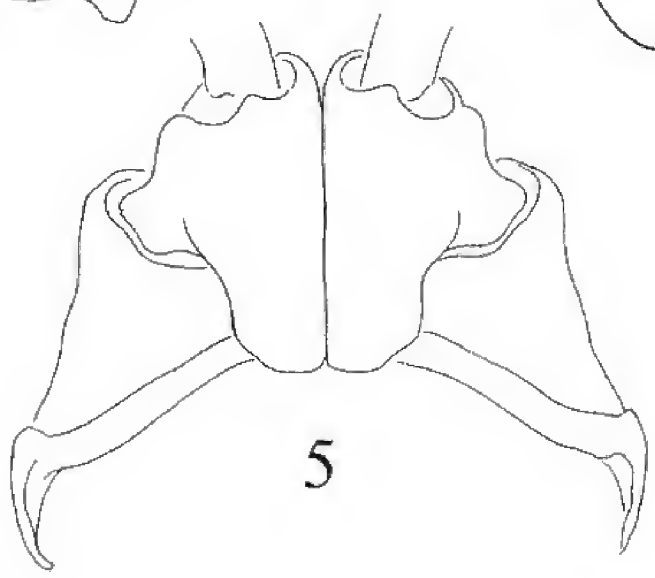

Hyloecostreptus shelleyi, peripheral structures. Fig. 1. Front of head, showing small and widely spaced ocellaria. Fig. 2. Antenna. Fig. 3. Gnathochilarium and mandible on right side. Fig. 4. Lateral lobe of collum. Fig. 5. Basal elements of 1st pair of legs, anterior aspect. Drawings from holotype.

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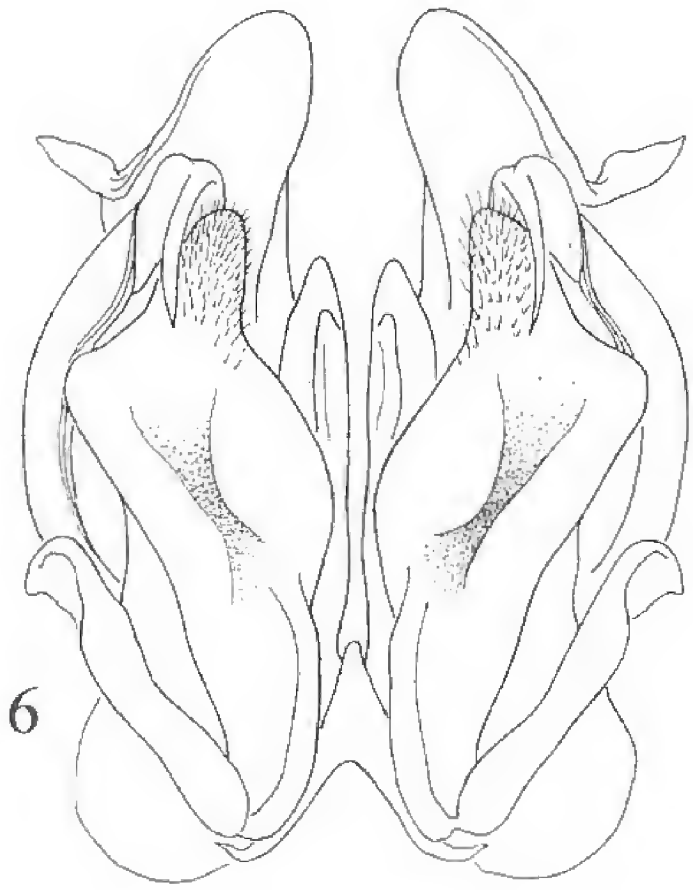

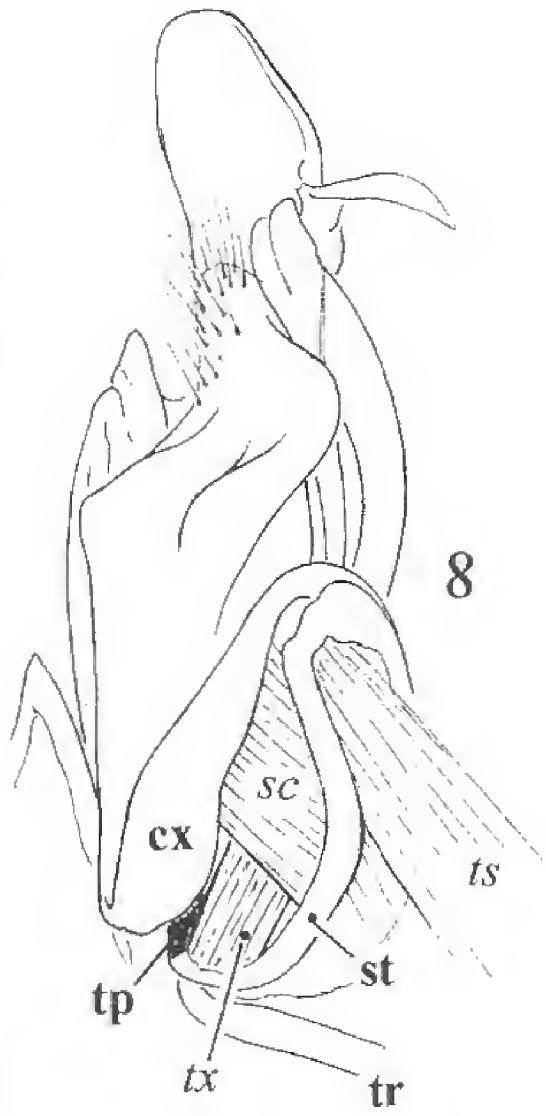

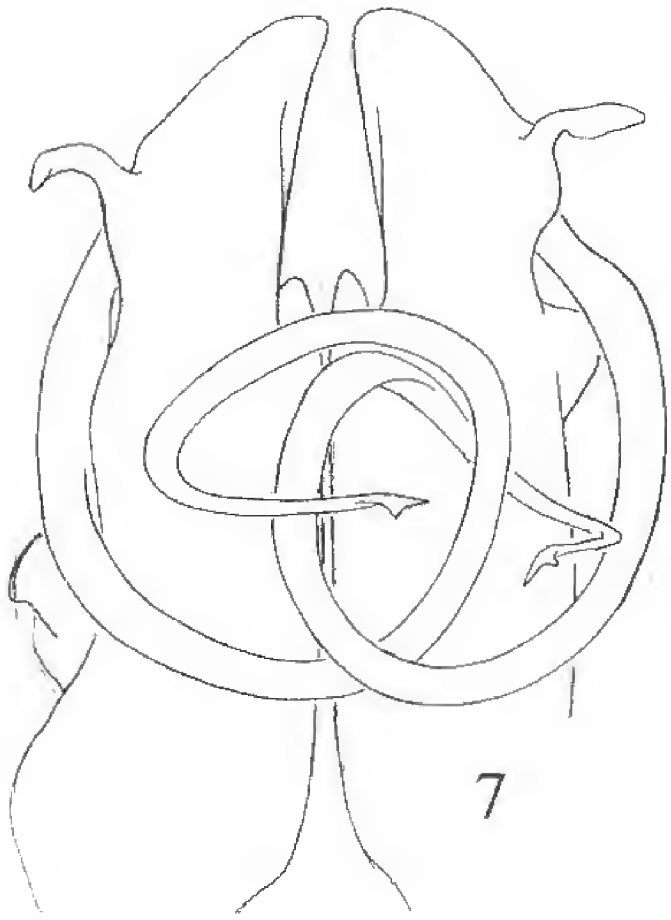

Hyloecostreptus shelleyi, gonopod structure. Fig. 6. Gonopods, anterior aspect. Fig. 7. Gonopods, posterior aspect. Fig. 8. Right gonopod, oblique anterolateral aspect. Abbreviations for sclerites in boldface: **cx,** coxa, **st**, lateral sternal element, **tp**, base of telopodite (black), **tr**, tracheal apodeme. Abbreviations for muscles in italic: *sc*, sternocoxal, *ts*, tracheosternal, *tx*, telopodite extensor.

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HOLOTYPE: Adult male with 54 body segments including epiproct, broken into several curved pieces, length ca. 50 mm, maximum diameter 3.6 mm. Original color lost in preservation, at present metazona and a band between ocellaria light brown, prozona and legs almost colorless. Major external structures as noted in the generic diagnosis.

Head smooth, unmodified, ocellaria small, subtriangular, separated by a space just over twice (14: 35) ocellarial length, ocelli in six rows: 9-9-8-6-4-2 = 38. Interantennal width very broad, exactly equal to interocellarial. 6-6 labral setae, 2-2 clypeal (Fig. 1). Antennae of moderate length, extending back to 2nd segment, 2nd, 3rd, and 6th article longest, subequal in length but 6th broadly suboviform (Fig. 2). Gnathochilarium of typical spirostreptid form, but (1) distal third of stipes notably convex and elevated above level of basal two-thirds, (2) prebasal sclerite strongly arcuate medally (Fig. 3).

Gonopods (Figs. 6-8): sternum triangular, not fused with base of metaplica; latter apically lingulate in profile, simple, slightly concave laminae with small lateral processes. Proplica strongly bowed laterad, and with distinct median concavity near midlength. Torsal region of telopodite located at primary curvature, just behind apex of proplica and barely visible in anterior aspect; antetorsal process small, acuminate, originating on anterior side and entirely visible. Phaneromere long, slender, gradually attenuated, without lateral projections or other modification except a minute sub-apical angle (Fig. 7). Coxosternal structure as shown in Fig. 9 (see also remarks in concluding section), coxal elements hinged at base of proplica and freely moveable.

First legs (Fig. 5): width across syncoxa relatively narrow, prefemoral lobes large and in contact along their entire length, apices bluntly truncated.

REMARKS: I have been unable to associate this species with any of the spirostreptids described from Loreto by R. V. Chamberlin in 1941.

Hyloecostreptus incertelineatus (Silvestri), new combination
Figure 9

Nanostreptus incertelineatus Silvestri, 1898, An. Mus. Nac.Buenos Aires, 6: 74. Location of syntypes not fully established, see discussion below, from "Monteredondo: Buena-Vista" Colombia (Burger).

MATERIAL: I have not personally examined specimens of this species. Silvestri indicated that the type material was the property of the Göttingen University museum. However, he retained at least one specimen for his personal collection at Portici (Viggiani, 1973), and at some time a specimen was studied (possibly in Portici) by Prof. Dr. O. Kraus (Krabbe, 1982, fig. 243). An inquiry addressed to Göttingen for information did not elicit a response.

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TYPE LOCALITY: "Monteredondo" [correctly Monte Redondo] is not shown on any map of Colombia available to me. It was a *posada* on the road from Bogotá to Villavicencio, in Burger's time (and well into the 20th Century) only a precarious mule track, located in a mountain pass at or very close to the border between Catamarca and Meta provinces. "Buena Vista" was another *posada* on the same trail, on the easternmost ridge of the Andes just west of Villavicencio

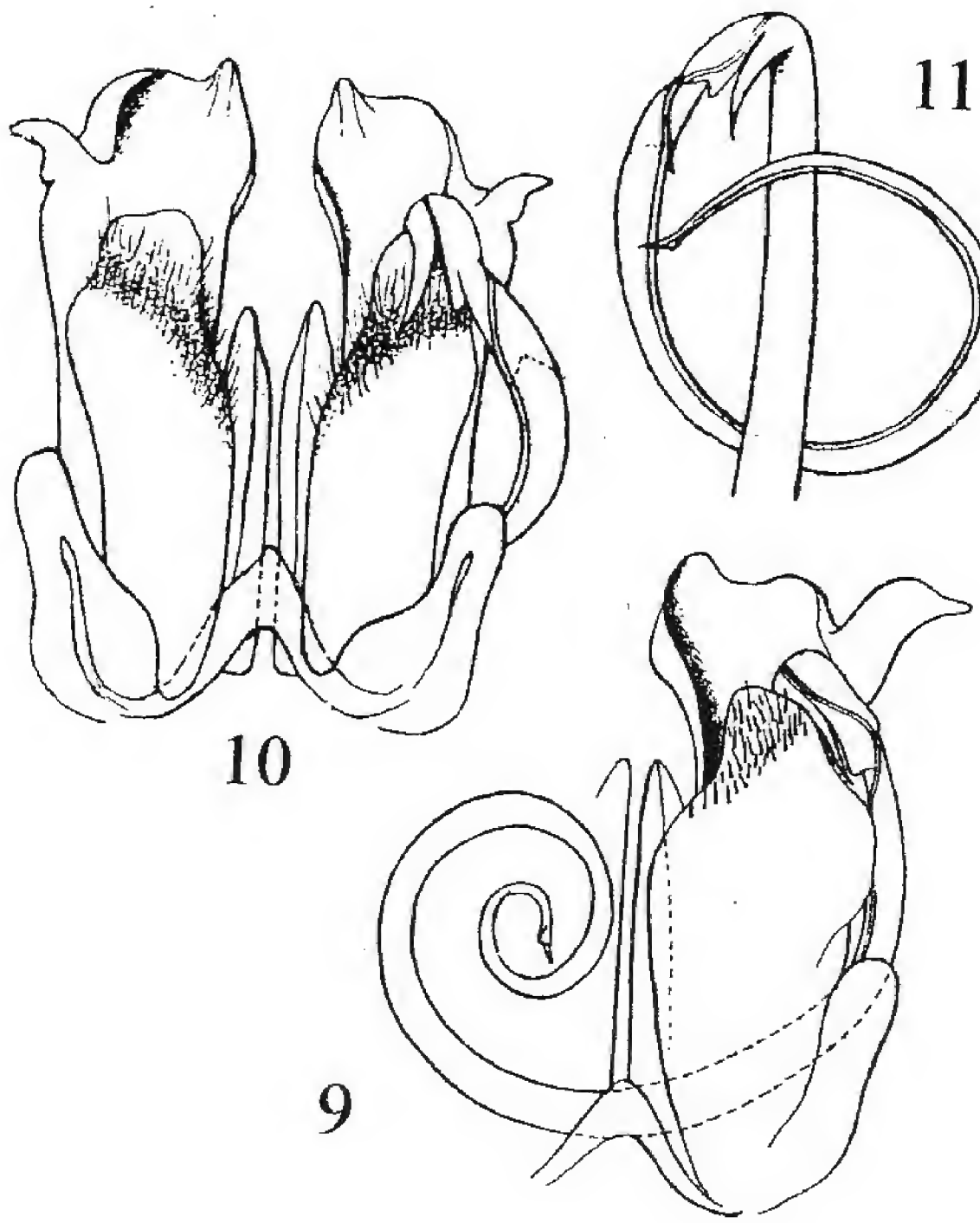

Fig. 9. *Hyloecostreptus incertilineatus* (Silvestri), right gonopod of syntype, anterior aspect. Fig. 10. *H. inconstans* (Carl), gonopods, anterior aspect, from ?syntype. Fig. 11. *H. inconstans,* telopodite of left gonopod, anterior aspect. All drawings from Carl, 1914.

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Hyloceostreptus inconstans (Carl), new combination
Figures 10, 11

Spirostreptus (Nanostreptus) inconstans Carl, 1914, Mem. Soc. Neuchâtel, Sci. nat., 5: 869, figs. 88-91. Syntypes MHNG, others?, from "La Camelia", a coffee plantation near Angelopolis, ca. 20 km southwest of Medellin, Antioquia Province, Colombia (O. Fuhrmann).

Spirostreptus inconstans: Attems, 1950, Ann. Naturh. Mus. Wien, 57: 195. – Schubart, 1958, Arq. Mus. Nac. Rio de Janeiro, 46: 247.

Nanostreptus (?) inconstans: Krabbe, 1982, Abh. Naturw. Ver. Hamburg, NF 24: 347.

NOTES ON GONOPOD STRUCTURE

The foregoing account of gonopod structure in *H. shelleyi* contains several previously unpublished anatomical terms. These are discussed fully in a paper treating some Central African taxa now in press, but can be briefly defined in this cameo appearance.

Proplica: the structure previously referred to as the anterior coxal fold (also as "Medianblatt" in German literature)

Metaplica: the structure previously called posterior coxal fold ("Lateralblatt")

Antetorsal process: previously femoral process ("Femoraldorn")

Phaneromere ("visible part"): that part of the telopodite exposed beyond the primary curvature, i.e., outside the gonocoel ("Exospermit" of Verhoeff).

The anatomical origin and homologies of the spirostreptoid gonopod have not been established conclusively. The traditional interpretation universally used for these modified appendages since at least the deductions by Brolemann (1920) was challenged by important insights published by Jeekel two decades ago (1985). This author proposed, inter alia, that the parts previously considered as coxal folds are in fact the telopodite of the gonopod, and the telopodite in the previous sense is a derivation of the cambaloid pseudoflagellum. This is a novel perception, and my failure to adopt it in recent papers does not constitute disbelief or rejection so much as the desire to accumulate additional information on these issues.

It is my impression that the so-called "paracoxites" are in fact composite structures composed of an actual coxal element plus an accessory elongated sclerite designated the "ampoule" by Demange (1967) who first made the distinction. The position was later taken (Hoffman & Howell, 1985) that the ampoule in fact corresponded exactly to Brolemann's concept of "brides trachéennes": lateral and posterior extensions of the original gonosternum. Presumably to accommodate

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extrusion and retraction of the gonopod along the axis of the telopodite, the median section of the sternum became detached on each side, and the lateral elements then fused with the base of the telopodite. Fig. 8 of this paper illustrates the various sclerites involved, with an indication of the relevant musculature. This depiction is based on a very superficial dissection of a single male, and obviously requires elaboration on a broad scale of many spirostreptid taxa.

It is to be noted that although the telopodite and lateral sternite are coalesced, the junction at the same place of the tracheal apodeme always remains a flexible joint.

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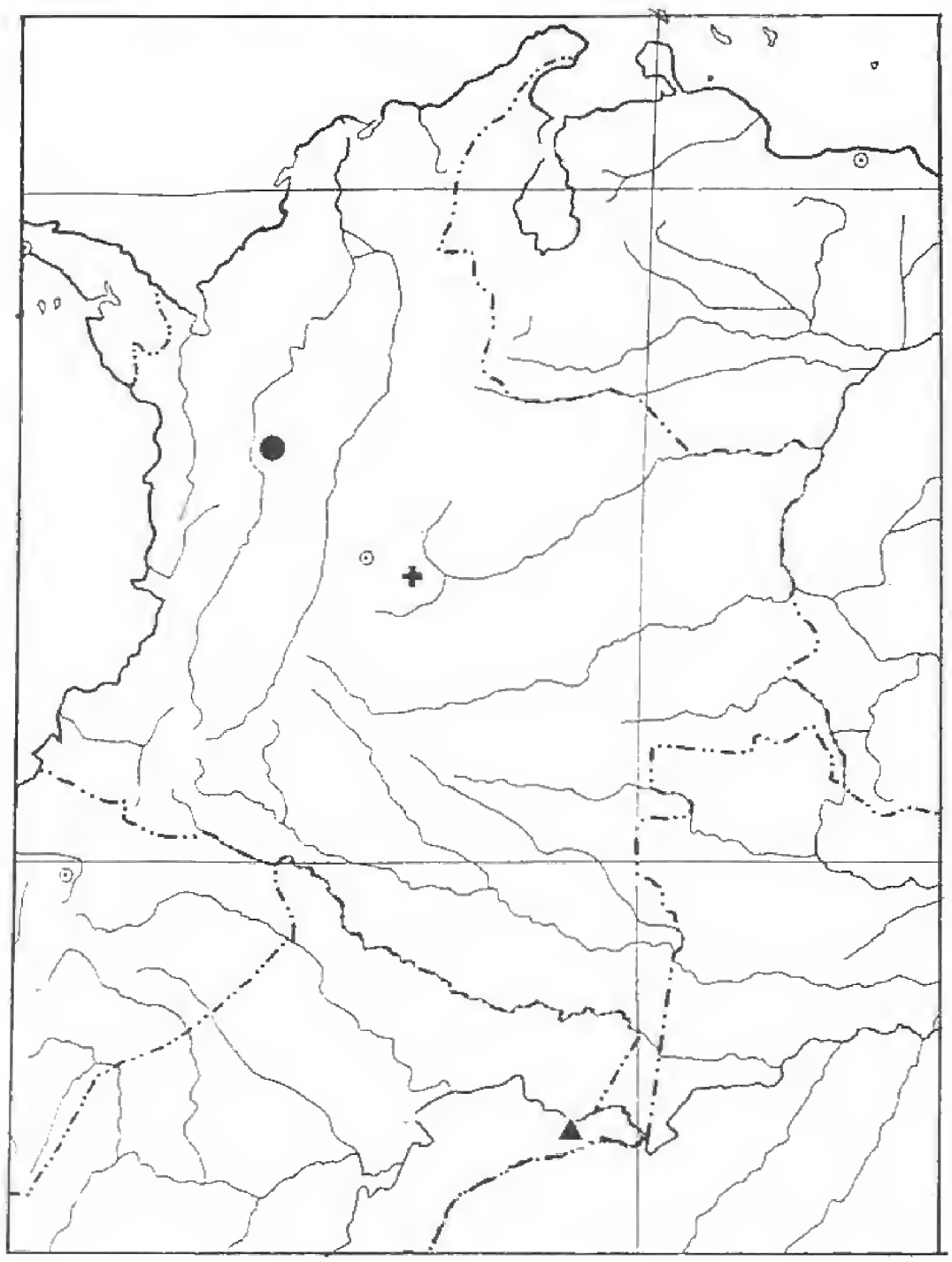

Fig. 12. Colombia and parts of adjacent countries, showing localities for *Hyloecostreptus shelleyi* (triangle), *H. incertilineatus* (cross), and *H. inconstans* (dot)

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